Employee Post-Travel Disclosure of Travel Expenses

Date/Time Stamp
RECEIVED
SECRETARY OF THE SENATE
PUBLIC RECORDS
2019 SEP 16 PM 2:50

Post-Travel Filing Instructions: Complete this form within **30 days** of returning from travel. Submit all forms to the **Office of Public Records in 232 Hart Building.**

In compliance with Rule 35.2(a) and (c), I make the following disclosures with respect to travel expenses that have been or will be reimbursed/paid for me. I also certify that I have attached:

☑ The **original** *Employee Pre-Travel Authorization* (Form RE-1), **AND**
☑ A **copy** of the *Private Sponsor Travel Certification Form* with all attachments (itinerary, invitee list, etc.)

Private Sponsor(s) (list all): Stanford University

Travel date(s): August 26 to 29, 2019

Name of accompanying family member (if any): _____
Relationship to Traveler: ☐ Spouse ☐ Child

IF THE COST OF LODGING **DID NOT INCREASE** DUE TO THE ACCOMPANYING SPOUSE OR DEPENDENT CHILD, ONLY INCLUDE LODGING COSTS IN EMPLOYEE EXPENSES. (Attach additional pages if necessary.)

Expenses for Employee:

	Transportation Expenses	**Lodging Expenses**	**Meal Expenses**	**Other Expenses (Amount & Description)**
☐ Good Faith Estimate ☒ Actual Amount	$599.45	$600 ($200/night)	$191.07	$86.68 CA ground transportation

Expenses for Accompanying Spouse or Dependent Child (if applicable):

	Transportation Expenses	**Lodging Expenses**	**Meal Expenses**	**Other Expenses (Amount & Description)**
☐ Good Faith Estimate ☐ Actual Amount	N/A	N/A	N/A	N/A

Provide a description of all meetings and events attended. *See* Senate Rule 35.2(c)(6). (Attach additional pages if necessary.):

_____

_____

9-16-2019 Virgilio Barrera
(Date) *(Printed name of traveler)* *(Signature of traveler)*

TO BE COMPLETED BY SUPERVISING MEMBER/OFFICER:

I have made a determination that the expenses set out above in connections with travel described in the *Employee Pre-Travel Authorization* form, are necessary transportation, lodging, and related expenses as defined in Rule 35.

9-16-2019
(Date) *(Signature of Supervising Senator/Officer)*

(Revised 1/3/11) **Form RE-2**

HART SENATE OFFICE BUILDING, ROOM 220
SECOND AND CONSTITUTION AVENUE, NE
WASHINGTON, DC 20510-6425

TELEPHONE: (202) 224-2981
FACSIMILE: (202) 224-7416
TDD: (202) 228-3752

United States Senate

SELECT COMMITTEE ON ETHICS

August 21, 2019

Virgilio Barrera
Office of Senator Martin Heinrich
United States Senate
Washington, DC 20510

Dear Mr. Barrera:

This responds to your recent correspondence concerning an invitation you received to travel to the *Stanford Cyber and Artificial Intelligence Boot Camp* in Stanford, California, on August 26–29, 2019, sponsored by Stanford University (Stanford). Stanford certified to the Select Committee on Ethics (the Committee) that it will pay the *necessary expenses*[1] related to the travel and that it is neither a lobbyist, nor lobbying firm, nor agent of a foreign principal, and it is not otherwise acting as a representative or agent of a foreign government. However, Stanford has certified that it is an organization designated under § 501(c)(3) of the Internal Revenue Code[2] that retains or employs a registered lobbyist and that no registered lobbyist or agent of a foreign principal will accompany you at *any point throughout your trip*.[3]

Based on information and materials available to the Committee, and assuming the **actual** travel and travel-related expenses conform to the information and materials you provided, it appears that the proposed payment or reimbursement of necessary expenses for this trip **may be accepted** under relevant Senate Rules and the Committee's *Regulations and Guidelines for Privately-Sponsored Travel*, so long as at the time of the payment or reimbursement, Stanford is neither a registered lobbyist nor lobbying firm under the Lobbying Disclosure Act of 1995, nor an agent of a foreign principal under the Foreign Agents Registration Act (and is not otherwise acting as a representative or agent of a foreign government), and provided the travel and all required documents are disclosed to the Secretary of the Senate in accordance with the provisions of Senate Rules 34 and 35.

Under Senate Rule 35, Senate staff must receive advance authorization signed by the Member or officer under whose direct supervision the individual works in order to accept payment or reimbursement for necessary expenses related to fact-finding travel. Further, such authorization and expenses must be disclosed to the Secretary of the Senate by filing the completed *Employee Pre-Travel Authorization* and the *Employee Post-Travel Disclosure of Travel Expenses* (Form RE-1 and Form RE-2), along with a copy of the *Private Sponsor Travel*

---

[1] The term "necessary expenses" has a specific definition. *See Select Committee on Ethics' Regulations and Guidelines for Privately-Sponsored Travel – Glossary of Terms* at 8.

[2] 26 U.S.C. § 501(c)(3).

[3] The term "any point throughout your trip" has a specific definition. *See Select Committee on Ethics' Regulations and Guidelines for Privately-Sponsored Travel – Glossary of Terms* at 2.

Certification Form, and all relevant attachments (e.g., the private sponsor's invitation and itinerary) **within 30 days of the conclusion of Privately-Sponsored Travel**.

Finally, Senate Rule 34 requires a reporting individual,[4] on his or her Financial Disclosure Report, to make an annual disclosure of the receipt of payments or reimbursements under Senate Rule 35 from a private sponsor for officially-related travel expenses where, in the aggregate, travel expenses exceed $390 from that sponsor during a calendar year. However, if a Member, officer, or employee properly reports the receipt of necessary expenses for such travel to the Secretary of the Senate within 30 days of the travel, as discussed above, the travel expenses need not be disclosed a second time on their Financial Disclosure Report.

I hope you find this information helpful. If you have any additional questions, please do not hesitate to contact the Committee.

Sincerely,

Deborah Sue Mayer

Deborah Sue Mayer
Chief Counsel and Staff Director

Enclosure: Travel Checklist

[4] A reporting individual is someone whose salary equals or exceeds 120% of the basic rate of pay for GS-15 ($127,914 for CY 2019) or is a political fund designee and is required to file Financial Disclosure Reports.

Date/Time Stamp:

EMPLOYEE PRE-TRAVEL AUTHORIZATION

Pre-Travel Filing Instructions: Complete and submit this form at least 30 days prior to the travel departure date to the **Select Committee on Ethics** in **SH-220.** Incomplete and late travel submissions will **not** be considered or approved. This form **must** be typed and is available as a fillable PDF on the Committee's website at ethics.senate.gov. Retain a copy of your entire pre-travel submission for your required post-travel disclosure.

Name of Traveler: Virgilio Barrera

Employing Office/Committee: Senator Martin Heinrich

Private Sponsor(s) (list all): Stanford University

Travel date(s): August 26 to 29, 2019

*Note: If you plan to extend the trip for any reason you **must** notify the Committee.*

Destination(s): Stanford, California

Explain how this trip is specifically connected to the traveler's official or representational duties:

I serve as a policy advisor to the Senator covering a wide-range of issues, including data privacy, cyber-security, and artificial intelligence. This trip will provide me continuing education and hands-on experience on cyber-security and AI technologies impacting government operations

Name of accompanying family member (if any): _____

Relationship to Employee: ☐ Spouse ☐ Child

I certify that the information contained in this form is true, complete and correct to the best of my knowledge:

8-2-19
(Date)

(Signature of Employee)

TO BE COMPLETED BY SUPERVISING SENATOR/OFFICER (President of the Senate, Secretary of the Senate, Sergeant at Arms, Secretary for the Majority, Secretary for the Minority, and Chaplain):

I, Martin Heinrich *(Print Senator's/Officer's Name)* hereby authorize Virgilio Barrera *(Print Traveler's Name)*

an employee under my direct supervision, to accept payment or reimbursement for necessary transportation, lodging, and related expenses for travel to the event described above. I have determined that this travel is in connection with his or her duties as a Senate employee or an officeholder, and will not create the appearance that he or she is using public office for private gain.

I have also determined that the attendance of the employee's spouse or child is appropriate to assist in the representation of the Senate. (*signify "yes" by checking box)* ☐

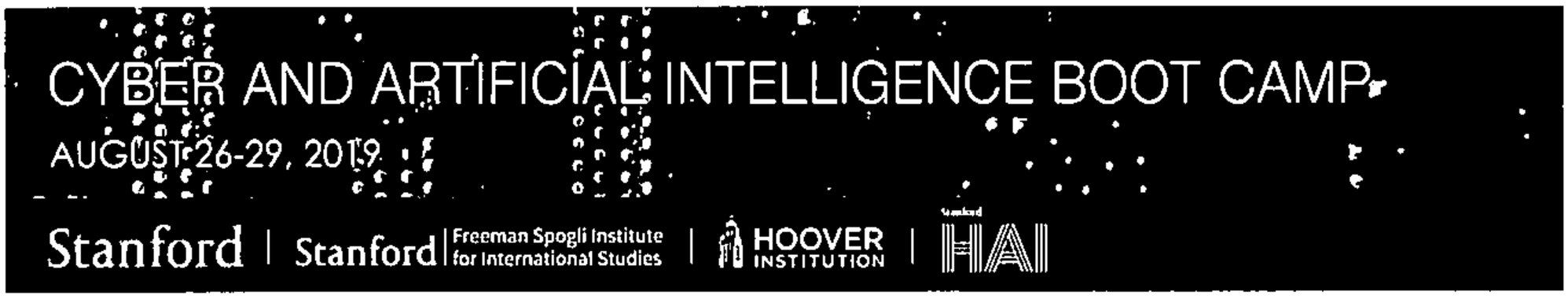
8-7-19
(Date)

(Signature of Supervising Senator/Officer)

(Revised 10/19/15)

Form RE-1

Tristan	Abbey	Energy & Nat	Senior Professional Staff			
Karolina	Arias	Senator Van	Policy Advisory and Minority Staff Director			
Jackie	Barber	Committee o	Chief Counsel			
Virgilio	Barrera	Senator Mart	Legislative Director			
Jacob	Barton	Senate Select	Professional Staff			
Greta	Bedekovics	Senate Comn	Professional Staff Member			
Michelle	Benecke	Homeland Se	Senior Counsel			
Emily	Clise	Senate Select	Professional Staff Member			
Katherine	Harris	Senate Select	Counsel for the Minority			
Sunmin	Kim	Sen. Schatz	Technology Policy Advisor			
Jackie	Maffucci	HSGAC	Policy Advisor			
Charlotte	Oldham-Moore	Senate Foreig	Senior Professional Staff Member			
Jacob	Olidort	Office of Sen	Foreign Policy Advisor			
Cherilyn	Pascoe	Senate Comn	Senior Professional Staff Member			
William	Payne	Sen. Ben Sass	Chief Counsel			
John	Riordan	Senate Arme	Professional Staff Member; Strategic forces SubCmte Lead			
Jacqueline	Russell	Senate Appro	Professional Staff Member			
Stephen	Smith	Senator King	Senior Policy Advisor			
Moon	Sulfab	Senator Mitc	Systems Administrator			
Chad	Tanner	Select Comm	Professional Staff Member			
Clint	Trocchio	Committee o	Deputy Clerk and Head of Analytics			
Matthew	Williams	Sen. Kamala	National Security Advisor			
Robert	Winkler	Senate Arme	Professional Staff Member			



Cyber and Artificial Intelligence Boot Camp

August 26-29, 2019

The Hoover Institution, Annenberg Conference Room 105, Lou Henry Hoover Building
434 Galvez Mall, Stanford, CA 94305

LEADERSHIP

Andrew Grotto
Program Director, Program on Geopolitics, Technology, and Governance, Stanford Cyber Policy Center, Freeman Spogli Institute
William J. Perry International Security Fellow, Center for International Security and Cooperation (CISAC)
Research Fellow, Hoover Institution
Dr. Herb Lin
Senior Research Scholar for Cyber Policy and Security, Center for International Security and Cooperation (CISAC)
Hank J. Holland Fellow in Cyber Policy and Security, Hoover Institution
Chief Scientist Emeritus, Computer Science and Telecommunications Board, National Academies

CONTACTS

Danielle Jablanski, djablanski@stanford.edu +1(650) 725-4839
Cyber Program Manager, Program on Geopolitics, Technology, and Governance, Stanford Cyber Policy Center, Freeman Spogli Institute
Russell Wald, rwald@stanford.edu +1 (202) 760-3204
Senior Manager for External Affairs
Hoover Institution, Stanford University

DAY 1 (Monday, August 26): Cyber Offense and Defense

9:49 a.m. - Arrive on Group Flight: United Airlines 1881 to San Francisco International Airport

11:30 am – 12:00 pm INTRODUCTION AND PROGRAM OVERVIEW

Faculty:

- **Andrew Grotto,** *William J. Perry International Security Fellow, Center for International Security and Cooperation (CISAC), Research Fellow, Hoover Institution*
- **Dr. Herb Lin,** *Senior Research Scholar, CISAC; Hank J. Holland Fellow, Hoover Institution*

12:00 pm – 12:30 pm LUNCH KEYNOTE & WELCOME

Opening Remarks:

- **H.R. McMaster,** *Fouad and Michelle Ajami Senior Fellow, Hoover Institution; Former assistant to the president for National Security Affairs; Retired Lieutenant General, U.S. Army*

12:30 pm – 1:30 pm THINKING LIKE AN ATTACKER

Faculty:

- **Dr. Greg Conti,** *Senior Security Strategist, IronNet Cybersecurity*
- **Dr. Herb Lin,** *Stanford University*
- **Andrew Grotto,** *Stanford University (Moderator)*

Effectively combating any adversary requires understanding the ways in which that adversary thinks. Cybersecurity adversaries — from state agents seeking to disable military systems to hacktivists seeking to make a political point — share a security mindset: a predilection for examining the ways in which the security of a system can be circumvented or penetrated. Whereas good engineering is about how a system can be made to work, the security mindset involves thinking about how some aspect of a system can be made to fail. Understanding this mindset is the first step towards designing sound cybersecurity solutions.

Assignment: **While in transit to the course location in Palo Alto, conduct a thought experiment for bringing an item prohibited by TSA regulations onto the airplane.**

Learning Objectives: Why defense is more difficult than offense and what makes ongoing offense-defense competition inevitable.

1:30 pm – 1:45 pm BREAK

1:45 – 3:00 pm KEYNOTE: CURRENT THREAT LANDSCAPE

- **Kevin Mandia,** *CEO, FireEye*
- **Sean Kanuck,** *Visiting Fellow, Hoover Institution; Former National Intelligence Officer for Cyber Issues, Office of the Director of National Intelligence*
- **Dr. Herb Lin,** *Stanford University (Moderator)*

Threat actors and their specific activity signatures, global hot spots and trends, are analyzed daily by various security agencies, governments, and organizations. This keynote will direct our attention to today's principal threat actors, providing a bird's eye view of the threat landscape, current trends and capabilities, future outlook of malicious cyber activity, and seeks to bust certain myths sometimes circulated or recounted incorrectly about cyber operations. Speakers will also provide first-hand examples of experiences tracking threats and bad actors, and share insights about working in this field.

3:00 pm – 3:15 pm BREAK

3:15 pm – 4:15 pm THREATS TO CYBERSECURITY

Faculty:

- **Carey Nachenberg,** *Chief Scientist, Chronicle; Adjunct Assistant Professor of Computer Science, UCLA*
- **Dr. Tom Berson,** *Visiting Scholar, Stanford CISAC; Advisory Board Member, Salesforce; Founder, Anagram Laboratories*
- **Dr. Herb Lin,** *Stanford University (Moderator)*

Cybersecurity compromises can take a variety of forms and occur for a variety of reasons. This session examines various known techniques and vulnerabilities in information technology that allow them to happen, painting a picture of a well-known cybersecurity theme: offense

dominance. This session will include forensic case studies that illuminate the spectrum of the attack surface, key challenges, and trends.

Learning Objectives: Security-relevant principles of information technology; types of compromises; inherent vulnerabilities of information technology; the hidden complexity of cyberspace; anatomy of security compromises; and the spectrum of threats to cybersecurity.

4:15 pm – 4:30 pm BREAK

4:30 pm – 5:30 pm DINNER: OFFENSIVE DIMENSIONS OF CYBERSECURITY

Faculty:

- **Dr. Herb Lin,** *Stanford University*
- **Jason Kichen,** *Vice President, Advanced Security Concepts, eSentire*
- **Andrew Grotto,** *Stanford University (Moderator)*

Offensive activities — including those conducted for espionage and attack purposes — serve a variety of national goals. This discussion will summarize the operational and strategic requirements, intelligence needs, organizational structure and policy considerations necessary for offensive cyber operations.

Learning Objectives: The role of offensive operations in cyberspace for improving the nation's cybersecurity posture, signaling, and other purposes; the differences between penetration and exploitation and their important distinctions; the scope and nature of U.S. command and control of offensive operations in cyberspace.

5:30 pm – 6:00 pm BREAK

6:00 pm – 8:30 pm HOSPITAL RANSOMWARE SIMULATION

The hospital has been the victim of a cyber-attack in the form of ransomware which successfully encrypts 250,000 files and holds at least one system hostage, demanding a ransom payment in Bitcoin (BTC) in return for a decryption key which will unlock its systems and restore access and functionality to the system. The hospital has a timeline of 72 hours to pay the ransom before their files become permanently encrypted and inaccessible, or are moved off their network.

Subject matter experts will act as the hospital's Chief Executive Officer and Chief Strategy Officer during the simulation, and staffers will be divided into teams to assist with directing action items, press releases, and critical decisions on how to manage the attack and response. Each team will have a coach aiding their organization and strategy. All names and information will be fictional, however, the simulated attack is based on previous real life scenarios. The information made available to participants is subject to change throughout the simulation. At the end of the exercise, teams will present their decision making processes to the hospital's CEO and Board of Trustees, and debrief on what it is like to face this type of cyber scenario in the real world.

DAY 2 (Tuesday, August 27): Technical & Nontechnical Approaches

8:30 am – 9:00 am BREAKFAST AND DAY 1 DEBRIEF

- **Andrew Grotto,** William J. Perry International Security Fellow, Center for International Security and Cooperation (CISAC), Research Fellow, Hoover Institution
- **Dr. Herb Lin,** *Senior Research Scholar, CISAC; Hank J. Holland Fellow, Hoover Institution*

9:00 am – 11:00 am HANDS ON HACK LAB

Faculty:

- **Alex Stamos,** *Visiting Scholar, Hoover Institution; Adjunct Professor, Stanford University; Director, Internet Observatory, Cyber Policy Center, Freeman Spogli Institute*

Stamos' course provides an introduction to the most common types of attacks used in cybercrime and cyberwarfare. As a long-time security practitioner, he covers the basics of an area of technology and how it has been misused. Participants will complete a lab session from his Stanford course in which they will be guided through attacking a known insecure system using techniques and tools seen in the field.

Participants will be required to bring a Windows or Mac laptop and will be provided with basic information for the exercise 2 weeks prior to the session. No computer science background is necessary for this session..

11:00 am – 11:15 pm BREAK

11:15 am – 12:15 pm LUNCH: CYBER RISK, ECONOMICS, AND ORGANIZATIONAL DIMENSIONS OF CYBERSPACE

Faculty:

- **Dr. Tyler Moore,** *Tandy Assistant Professor of Cyber Security and Information Assurance, University of Tulsa*
- **Dr. Greg Falco,** *Security Researcher, Stanford CISAC*
- **Dr. Herb Lin,** *Stanford University (Moderator)*

Known cybersecurity measures are often not fully adopted due to a variety of economic and organizational factors. These factors are non-technical in nature and often underappreciated by technical and policy communities. Economics describe the incentives that apply to cyber defenders and adversaries, including the nature of cybersecurity market failures and the ability to handle collective action problems. The insurance sector is working to provide accurate and adequate coverage for this market. This session examines how these factors often discourage the adoption of sound security practices.

Learning Objectives: The importance of economic and organizational factors of cybersecurity and why they are often overlooked in efforts to improve cybersecurity; how government action might help to address non-technical factors that diminish the nation's cybersecurity posture.

12:15 pm – 12:30 pm BREAK

12:30 pm – 1:30 pm PRIVACY & SECURITY FOR CONSUMERS, CUSTOMERS, AND CRITICAL INFRASTRUCTURE

Faculty:

- **Robert Chesney,** *Associate Dean and Charles I. Francis Professor, University of Texas School of Law; Director, Robert S. Strauss Center for International Security and Law*
- **Ted Gizewski,** *Vice President, Product Legal, Salesforce*
- **Andrew Grotto,** *Stanford University (Moderator)*

Privacy and security risks manifest differently in different business sectors. They also share important interdependencies that require integrated risk management and policy-making strategies.

Learning objectives: Gaining insight into how privacy and security risks affect different sectors, how risk management strategies must be tailored to the risk environment, and why an integrated approach to managing privacy and security risks is imperative.

1:30 pm – 1:45 pm BREAK

1:45 pm – 2:45 pm INTERNATIONAL LAW AND CYBERSECURITY

Faculty:

- **Dr. Tess Bridgeman,** *Senior Fellow, Center on Law and Security, NYU*
- **Dr. Herb Lin,** *Stanford University*
- **Andrew Grotto,** *Stanford University (Moderator)*

Technological change has far outpaced updates to laws and regulatory frameworks, and will almost certainly continue to do so in the future. This lag consequentially challenges Congress to craft legislation appropriate for future technologies. Furthermore, nations have cooperative and competitive (and sometimes adversarial) interests that play out in cyberspace, devoid of national borders, giving an international dimension to every cybersecurity and policy challenge.

Learning Objectives: The implicit technological assumptions of existing cybersecurity laws; what problems arise in applying existing international law to technological circumstances not contemplated at the time of initial passage. These include the law of armed conflict, human rights, proposals for internet governance; and different non-governmental organizations that affect the design and operation of the Internet.

2:45 pm – 3:45 pm FUNDAMENTALS OF DEFENSE FOR CYBERSECURITY

Faculty:

- **Dr. Irving Lachow,** *Visiting Fellow, Hoover Institution; Affiliate, CISAC; Portfolio Manager, International Cybersecurity, MITRE*
- **Andrew Grotto,** *Stanford University*
- **Dr. Herb Lin,** *Stanford University (Moderator)*

Cybersecurity can be a deeply technical subject, especially in how cybersecurity solutions are implemented, a few fundamental principles underlie most solutions. This session takes a deep dive into the principles of improving cybersecurity and how they fit together. These include reducing reliance on information technology, detecting cybersecurity compromises, and

blocking and limiting the impact of compromise. Additional topics include authentication, access control, forensics, recovery, containment, resilience, and active defense.

Learning Objectives: The value of these fundamental principles of cybersecurity, understanding interdependencies, and how to use fundamentals and understanding collectively to improve security.

3:45 pm – 4:00 pm BREAK

4:00 pm – 5:00 pm CYBER ENABLED INFORMATION WARFARE AND INFLUENCE OPERATIONS

Faculty:

- **Dr. Rosanna Guadagno,** *Director, Information Warfare Working Group, Stanford University*
- **Dr. Herb Lin,** *Stanford University*
- **Andrew Grotto,** *Stanford University (Moderator)*

Cyber-enabled information warfare is fundamentally different than cyber war and cyber conflict, at least as the latter are generally understood today in the policy world. Cyber war and cyber conflict target information and information technology systems, whereas cyber-enabled information warfare targets human minds. Russia did not "hack" Facebook and YouTube and Twitter by penetrating their security—it used those platforms exactly as they were designed to be used. This session delves into these differences, placing the emphasis on the psychological vulnerabilities of people that the Russians (and other institutional users of social media) exploit for gain.

Learning Objectives: Understanding the fundamental differences between cyber war and cyber-enabled information warfare; the psychology underlying cyber-enabled information warfare; and the present inadequacies of the U.S. government in coping with such warfare.

5:00 pm – 6:30 pm BREAK

6:30 pm – 8:30 pm KEYNOTE RECEPTION/DINNER – ARTIFICIAL INTELLIGENCE

- **Dr. John Etchemendy,** *Co-Director, Stanford Institute for Human-Centered Artificial Intelligence; Provost Emeritus, and Patrick Suppes Family Professor in the School of Humanities, Stanford University*
- **Reid Hoffman,** *Co-founder and former Executive Chairman, LinkedIn*
- **Ambassador Michael McFaul,** *Senior Fellow, Freeman Spogli Institute for International Studies; Senior Fellow, Hoover Institution, Stanford University (Moderator)*

Artificial intelligence technologies are augmenting human capability and efficiency, changing the way we think about and interact with information, and creating new governance challenges and opportunities for policy makers and business leaders. Please join two distinguished thought leaders to discuss critical issues facing the future of human-centered AI development, innovation, and governance.

DAY 3 (Wednesday, August 28): Industry Voices, and the Future of Artificial Intelligence

9:00 am – 9:30 am BREAKFAST AND DAY 2 DEBRIEF

- **Andrew Grotto,** *William J. Perry International Security Fellow, Center for International Security and Cooperation (CISAC), Research Fellow, Hoover Institution*
- **Dr. Herb Lin,** *Senior Research Scholar, CISAC; Hank J. Holland Fellow, Hoover Institution*

9:30 am – 10:45 am INDUSTRY PERSPECTIVES PANEL

- **Dr. Sameer Bhalotra (Chair),** *Co-Founder and CEO, ActZero.ai; Affiliate, CISAC; Senior Associate of the Strategic Technologies Program, CSIS; former Senior Director for Cybersecurity, National Security Council*
- **Frank Chen,** *Partner, Andreessen Horowitz*
- **Michelle Finneran Dennedy,** *Vice President, Chief Privacy Officer, Cisco*
- **Rick Howard,** *Chief Security Officer, Palo Alto Networks*
- **Dr. Mark Rosekind,** *Chief Safety Innovation Officer, Zoox*

Market forces have a critical role in enhancing or weakening security and privacy considerations. This session examines how such forces play out at the level of the individual firm and incorporate the views and concerns of the business community. Silicon Valley senior executives and engineers will give their "ground truths" about the security problems facing the private sector.

Learning Objectives: Various private sector perspectives on technology and relations beyond Silicon Valley from technology firms that support innovative efforts for providing IT-based products and services with attention to cybersecurity and AI.

10:45 am – 11:00 am BREAK

11:00 am – 12:00 pm FUNDAMENTALS OF AI AND MACHINE LEARNING

Faculty:

- **Dr. Emma Brunskill,** *Assistant Professor, Computer Science, Stanford University; Stanford AI for Human Impact Lab*
- **Dr. Jeff Clune,** *Harris Associate Professor, Computer Science, University of Wyoming; Senior Research Manager, Uber AI Labs*
- **Andrew Grotto,** *Stanford University, (Moderator)*

Machine learning and the algorithms that fuel its applications have important principle foundations including deep learning neural networks, increased complexity in evolving neural networks, and robotics developments which are increasingly intelligent, adaptable, and resilient. Also known as reinforcement learning, algorithms can learn from experience to make decisions or provide diagnostics in applications such as educational software, healthcare decision making, robotics, or people-facing applications. This session will explain the basic elements of machine learning, and the typical environment for building and testing neural networks and reinforcement learning.

Learning Objectives: Practical applications and limits of machine learning, the broad strokes of development of deep neural networks, and the overall veracity of both development and applications of this technology. Faculty will also speak to the trajectory of the technology, and any risks it may pose from a technical perspective.

12:15 pm – 1:15 pm KEYNOTE LUNCH: ARTIFICIAL INTELLIGENCE AND SAFETY

- **Dr. Fei-Fei Li,** *Co-Director, Stanford Human-Centered Artificial Intelligence Initiative, Stanford University; Professor, Computer Science, Stanford University*
- **Mykel Kochenderfer,** *Assistant Professor of Aeronautics and Astronautics, Stanford University; Director, Stanford Intelligent Systems Laboratory*
- **Andrew Grotto,** *Stanford University (Moderator)*

Building robust decision making systems is challenging, especially for safety critical systems such as unmanned aircraft and driverless cars. Decisions must be made based on imperfect information about the environment and with uncertainty about how the environment will evolve. In addition, these systems must carefully balance safety with other considerations, such as operational efficiency. Typically, the space of edge cases is vast, placing a large burden on human designers to anticipate problem scenarios and develop ways to resolve them.

Learning Objectives: We will discuss ways in which artificial intelligence can be applied to the design of these safety critical systems. This approach has the potential to significantly improve robustness of these systems, but there are two major challenges. The first is in ensuring computational tractability, and the other is establishing trust in their correct operation when deployed in the real world. We will outline some methodologies for addressing these challenges.

1:15 pm – 1:30 pm BREAK

1:30 pm – 2:30 pm ETHICS AND GOVERNANCE FOR AI

Faculty:

- **Dr. John Villasenor,** *Visiting Fellow, Hoover Institution; Professor of Electrical Engineering, Law, Public Policy, and Management, University of California Los Angeles*
- **Dr. Patrick Lin,** *Director, Emerging Sciences Group, California Polytechnic State University*
- **Dr. Herb Lin, Stanford** *University (Moderator)*

Advances in AI are raising a set of fundamentally important questions that go well beyond technology. This session will explore key AI ethics and governance issues, such as the nuances and challenges of addressing questions like: What should the rules be when machines make decisions with ethical implications, and who writes those rules? How can the issue of bias in AI be addressed?

Learning Objectives: The sorts of governance structures that can best ensure a climate of innovation in the AI ecosystem while also protecting against its potential misuses. What special issues are raised by AI in defense and security specifically.

2:40 pm – 3:50 pm HOOVER TOWER AND ARCHIVES TOUR

Founded by Herbert Hoover in 1919, the Hoover Institution Library & Archives are dedicated to documenting war, revolution, and peace in the twentieth and twenty-first centuries. With nearly one million volumes and more than six thousand archival collections from 171 countries, Hoover supports a vibrant community of scholars and a broad public interest in the meaning and role of history.

4:15 pm – 5:30 pm VISIT TO CENTER FOR AUTOMOTIVE RESEARCH AT STANFORD

<u>Faculty:</u>

- **Dr. Stephen Zoepf,** *Executive Director, Center for Automotive Research, Stanford University*
- **Bryan Casey,** *Lecturer in Law, Stanford University*
- **Marco Pavone,** *Associate Professor, Aeronautics and Astronautics, Stanford University*

The Center for Automotive Research at Stanford (CARS) brings together researchers, students, industry, government and the community to enable a future of human-centered mobility. Understanding how people and machines work together has never been so important than when building vehicles of the future. CARS supports educational experiences for students, infrastructure for research and events that bring students and campus researchers together with industry professionals and the broader community. Researchers and vehicles affiliated with CARS are housed at the Automotive Innovation Facility, which houses the Volkswagen Automotive Innovation Lab (often referred to as 'VAIL'), a state-of-the-art vehicle research facility where interdisciplinary teams can work on projects that move vehicle human-centered mobility forward.

Participants will visit CARS' Automotive Innovation Facility and hear from researchers on the cutting edge of the development of autonomous vehicles. Experts will brief the group on trends in the field, ongoing legal and ethical debates, and provide a tour of the facility showcasing vehicles and a driving simulator used for research.

6:00 pm – 8:00 pm DINNER AND REFLECTIONS

Coupa Café
198 Junipero Serra Blvd, Stanford, CA, 94305

Thursday, August 29: Shuttle will arrive to Schwab Residential Hall at 6:30am to depart for San Francisco International Airport

9:30 a.m. - Depart on Group Flight: United Airlines 516 to Dulles International Airport